CLAIMS

What is Claimed is:

1.   A method for detecting defects in a reticle used in integrated circuit chip fabrication, said method comprising:

(a) obtaining digital image data corresponding to an image of a reticle;

(b) processing the digital image data according to predetermined criteria to identify defects; and

(c) simulating a response that would be produced if the reticle were to be utilized in a photolithographic system, by processing the digital image data corresponding to the reticle.

2.   A method according to Claim 1, wherein the digital image data are obtained by scanning the reticle.

3.   A method according to Claim 1, wherein the defects are identified in step (b) by comparing the digital image data to reference digital image data.

4.   A method according to Claim 1, wherein step (c) simulates an aerial image which would be produced by the reticle.

5.   A method according to Claim 1, further comprising a step of categorizing defects based on simulation results produced in step (c).

6.   A method according to Claim 1, wherein the digital image data are in raster format.

7.   A method according to Claim 1, further comprising a step of modifying a format of the digital image data prior to performing step (c).

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8.   A method according to Claim 1, further comprising a step of providing a reference simulation for comparison to a simulation produced in step (c).

9.   A method for detecting defects in a reticle used in integrated circuit chip fabrication, said method comprising:

   (a) obtaining digital image data corresponding to an image of a reticle;

   (b) processing the digital image data according to predetermined criteria to identify defects;

   (c) specifying a window around one of the defects identified in step (b); and

   (d) simulating a response that would be produced if the window specified in step (c) were to be utilized in a photolithographic system, by processing digital image data corresponding to the window specified in step (c).

10.   A method according to Claim 9, wherein the digital image data are obtained by scanning the reticle.

11.   A method according to Claim 9, wherein step (d) simulates an aerial image which would be produced by the window.

12.   A method according to Claim 9, further comprising a step of categorizing defects based on simulation results produced in step (d).

13.   A method according to Claim 9, further comprising a step of simulating a window of corresponding reference image data for comparison to simulation results produced in step (d).

14.   A method according to Claim 9, wherein the window is 64 x 64 pixels.

15.   A method according to Claim 9, wherein the digital image data processed in step (d) are grayscale data.

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16.   A method according to Claim 9, wherein the defects are identified in step (b) by comparing the digital image data to reference digital image data.

17.   An apparatus comprising a computer readable medium having encoded thereon computer-executable process steps, said process steps for detecting defects in a reticle used in integrated circuit chip fabrication, wherein said process steps comprise steps to:

5   (a) obtain digital image data corresponding to an image of a reticle;

(b) process the digital image data according to predetermined criteria to identify defects; and

(c) simulate a response that would be produced if the reticle were to be utilized in a photolithographic system, by processing the digital image data

10   corresponding to the reticle.

18.   An apparatus according to Claim 17, wherein said computer readable medium comprises at least one of a magnetic diskette, magnetic tape, a CD-ROM, a random access memory chip, and a read-only computer memory chip.

19.   An apparatus comprising a computer readable medium having encoded thereon computer-executable process steps, said process steps for detecting defects in a reticle used in integrated circuit chip fabrication, said process steps comprising steps to:

5   (a) obtain digital image data corresponding to an image of a reticle;

(b) process the digital image data according to predetermined criteria to identify defects;

(c) specify a window around one of the defects identified in step (b); and

(d) simulate a response that would be produced if the window specified in step

10   (c) were to be utilized in a photolithographic system, by processing digital image data corresponding to the window specified in step (c).

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20.   An apparatus according to Claim 19, wherein said computer readable medium comprises at least one of a magnetic diskette, magnetic tape, a CD-ROM, a random access memory chip, and a read-only computer memory chip.

21.   An apparatus for detecting defects in a reticle used in integrated circuit chip fabrication, said apparatus comprising:

a processor for executing stored program instruction steps; and

a memory connected to the processor for storing the program

5   instruction steps,

wherein the program instruction steps include steps to:

(a) obtain digital image data corresponding to an image of a reticle;

(b) process the digital image data according to predetermined

10   criteria to identify defects; and

(c) simulate a response that would be produced if the reticle were to be utilized in a photolithographic system, by processing the digital image data corresponding to the reticle.

22.   An apparatus for detecting defects in a reticle used in integrated circuit chip fabrication, said apparatus comprising:

a processor for executing stored program instruction steps; and

a memory connected to the processor for storing the program

5   instruction steps,

wherein the program instruction steps include steps to:

(a) obtain digital image data corresponding to an image of a reticle;

(b) process the digital image data according to predetermined

10   criteria to identify defects;

(c) specify a window around one of the defects identified in step (b); and

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(d) simulate a response that would be produced if the window specified in step (c) were to be utilized in a photolithographic system, by processing digital image data corresponding to the window specified in step (c).

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